**Algebra 1 Name:**

**2.4 Warm Up Date:**

Read the situations and set up a **ratio** for each situation. Then set up a **proportion** to answer the questions.

1. *The ratio of boys**to girls in the 9th grade class is 4 to 5. If there are 45 girls in the 9th grade, how many boys are there?*

*Ratio*

*Proportion*

1. *After trick-or-treating, the ratio of M&M’s to Mini Twix in your bucket is 3 to 7. If you have 21 M&M’s in your bucket, how many Mini Twix do you have?*

*Ratio*

*Proportion*

**Using Ratios and Proportions in Real Life: *Similarity* and *Scale***

**Main Idea #1:** Ratios and proportions are used all the time in a number of professions, and perhaps most often in architecture and design. Proportions can be used to calculate unknown distances using *similarity* and *scale.*

**Similarity**

Two shapes are **similar** when they have the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_ but different \_\_\_\_\_\_\_.

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| --- | --- |
| Triangle ABC is **similar** to triangle DEF. | These two quadrilaterals are **similar**. |

We can use the similarity of two shapes to calculate the length of unknown sides by setting up a proportion. To do that, **first** create a ratio (a relationship between two values). **Then** create a proportional ratio, making sure that the first numerator corresponds to the second numerator, and that the denominators also correspond.

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| **Example 1:**  *In the triangles above, the following sides have the following lengths:*  *AB = 18 mm, BC = 30 mm, DE =* 9 mm  What is the length of *EF*? | **Example 2:**  What is the missing length in the quadrilaterals above? |

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| **Practice:** Create a proportion to determine the length of the missing side in these two proportional figures. |

**Scale**

**Scale** is the one of the most important concepts in creating models, blueprints, plans, and maps. The scale of a model is the ratio of the distance in the model to the corresponding distance in real life.

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| **Example 1:** Jania designed a dress she wanted to wear to the winter dance. The scale of her drawing was 1 inch : 15 inches. If the length of one of the sleeves of her dress in her drawing was 4 inches, what should be length of the fabric that she cuts for her sleeve in real life? |
| **Example 2:** Thalia’s design for Washington DC’s first skyscraper won the architecture contest. In her model, the skyscraper is 23 inches tall. If the scale of the model is 1 in : 1,000 feet, what will the height of the skyscraper be when it is built? |
| **Example 3:** When Christopher Columbus sailed to America, the map he used had a scale of 1 in : 20 miles. When he calculated that his boat moved 2.5 inches on his map, how far did he sail in real life? |

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